



UPS R3000 XR

Maintenance and Service Guide

First Edition (September 2000)
Part Number 221891-001
Spare Part Number 223932-001
Compaq Computer Corporation

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About This Guide

This Maintenance and Service Guide is a troubleshooting guide that can be used for reference when servicing Compaq R3000 XR series of Uninterruptible Power Systems (UPSs).



WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs could create conditions that are hazardous.

IMPORTANT: The installation of options and servicing of this product shall be performed by individuals who are knowledgeable of the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings:



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.



CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Compaq Technician Notes



WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indications of component replacement or printed wiring board modifications may void any warranty.



WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels, do not exceed the level of repair specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs could create conditions that are hazardous.



WARNING: To reduce the risk of electric shock or damage to the equipment:

If the system has multiple power supplies, disconnect power from the system by unplugging all power cords from the power supplies.

Do not disable the power cord grounding plug. The grounding plug is an important safety feature.

Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.



CAUTION: To properly ventilate your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the UPS.



CAUTION: The UPS is designed to be electrically grounded. To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

Where to Go for Additional Help

In addition to this guide, the following information sources are available:

- User Documentation
- *Compaq Service Quick Reference Guide*
- Service Training Guides
- Compaq Service Advisories and Bulletins
- Compaq QuickFind
- Compaq *Insight Manager*[™]
- Compaq Download Facility: Call 1-281-518-1418

Telephone Numbers

For the name of your nearest Compaq Authorized Reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868

For Compaq technical support:

- In the United States and Canada, call 1-800-386-2172
- For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq website at

<http://www.compaq.com>

Chapter 1

Before You Begin

Safety and Product Information



WARNING: The Compaq Uninterruptible Power System (UPS) R3000 XR contains hazardous voltage levels and energy circuits. There is a risk of personal injury from electrical shock and hazardous energy levels. Persons performing installation or service procedures must be Trained Service Technicians, knowledgeable about the procedures, precautions, and hazards associated with AC Power Products.

Symbols on Equipment

These icons may be located on equipment in areas where hazardous conditions may exist.



Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce risk of injury from electrical shock hazards, do not open this enclosure.



Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.



weight kg
weight lb

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local health and safety requirements and guidelines for manual material handling.

Technician Notes



WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels:

Only authorized technicians trained by Compaq should attempt to repair this equipment.

The installation of options and routine maintenance and service of this product must be performed by Trained Service Technicians who are knowledgeable about the procedures, precautions, and hazards associated with AC Power Products.

Do not exceed the level of repair specified in these procedures. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

Remove all watches, rings, and any other metal or loose-fitting jewelry.

Avoid the use of conductive tools that could bridge live parts.

Rack



WARNING: To reduce the risk of personal injury or damage to the equipment, ensure that:

The leveling jacks are extended to the floor.

The full weight of the rack rests on the leveling jacks.

The stabilizing feet are attached to the rack for a single rack installation.

The racks are coupled in multiple rack installations.

You extend only one component at a time. A rack may become unstable if more than one component is extended for any reason.

Weight



82 lb
37 kg

WARNING: The UPS R3000 XR weighs 82 lb (37 kg) when fully assembled. The battery pack weighs 42 lb (19 kg). To reduce the risk of personal injury or damage to the equipment:

Observe local health and safety requirements and guidelines for manual material handling.

Obtain adequate assistance to lift and stabilize the product during installation or removal.

Remove all pluggable options and batteries to reduce the overall weight of the product.

Install the UPS R3000 XR and the Extended Runtime Modules (ERMs) only at the bottom of the rack. If placed in a rack with existing equipment, the rack must be reconfigured to allow installation of the UPS at the bottom of the rack.

Mount the UPS R3000 XR only on the fixed rails included in the UPS package. Refer to the appropriate installation card and rack template, shipped with the UPS R3000 XR kit, for instructions on rack-mounting the UPS.

Communication Ports



CAUTION: To reduce the risk of damage to the equipment, only use the DE9 UPS/Computer Interface cable supplied by Compaq (part number **201092-00X**) to connect the communications port to the host computer. Do not use standard RS-232 cables.

This UPS/Computer Interface Cable carries power and is specifically designed for UPS communications.

Extended Runtime Modules and Batteries

Observe these precautions when handling or connecting batteries and Extended Runtime Modules.



WARNING: To reduce risk of personal injury from electric shock or damage to equipment:

A Trained Service Technician must install all batteries and the Extended Runtime Modules (ERMs).

Do not attempt to replace batteries unless all battery circuit breakers on any connected ERMs are in the OFF (down) position. There is a 120-volt potential across the batteries.



WARNING: To reduce the risk of personal injury or equipment damage, adhere to the following precautions when handling batteries:

Make sure that only qualified personnel handle or connect the batteries.

Remove watches, rings, or other metal objects prior to working with the equipment.

Use tools with insulated handles.

Do not attempt to replace batteries unless all battery circuit breakers on any connected ERMs are in the OFF (down) position. There is a 120-volt potential across the batteries.

This UPS contains sealed lead-acid batteries. To reduce the risk of fire or chemical burns, adhere to the following precautions:

Do not attempt to recharge batteries after removal from the UPS.

Do not disassemble, crush, or puncture the batteries.

Do not short the external contacts of the batteries.

Do not immerse the batteries in water.

Do not expose the batteries to temperatures higher than 60°C or dispose of in fire.

Use only the Compaq battery spare designated for this UPS.

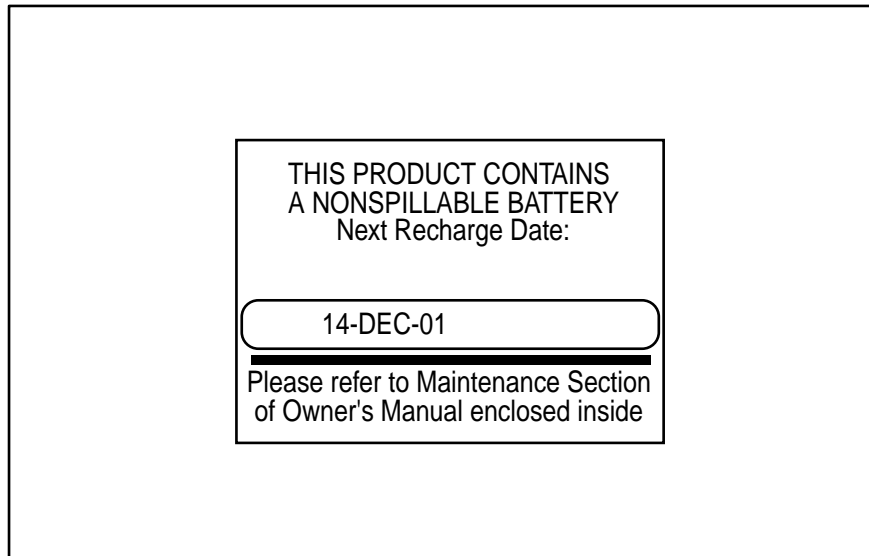
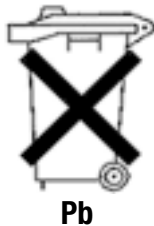


Figure 1-1. Checking the battery recharge date label

IMPORTANT: Do not use the batteries if the recharge date has passed (Figure 1-1). If the date on the Battery Recharge Date Label has passed without the batteries being recharged, contact an Authorized Compaq Service Representative.

IMPORTANT: Compaq recommends that you do not maintain an inventory of spare batteries on-site unless you implement a procedure to keep these batteries charged while in storage.



Do not dispose of used batteries with general office or household waste. Return the used battery for proper disposal to:

Compaq, your authorized Compaq Partners, or their agents

A recycling center that meets all local environmental standards

Remote Emergency Power Off (REPO)

If the UPS R3000 XR is to be installed in a computer equipment room, it must be connected to a Remote Emergency Power Off (REPO) circuit. The UPS R3000 XR REPO port is designed to meet the requirements stated in National Electrical Code (NFPA 70) Article 645-10 and 11 in North America or the equivalent local and/or national wiring regulations.



WARNING: To reduce risk of personal injury or damage to equipment:

Only a licensed electrician can wire the REPO port.

Verify that the main breaker switch is in the OFF position before wiring the REPO port.

In North America, the REPO circuit must comply with the NEC (NFPA 70, Article 725) for a Class 2 circuit. The REPO port wiring must also meet all other national and local standards in the area in which it is installed.

Chapter **2**

Illustrated Parts List

This chapter provides the illustrated parts breakdown and a spare parts list for the Compaq UPS R3000 XR. See Table 2-1 for the names of referenced spare parts.

Exploded View

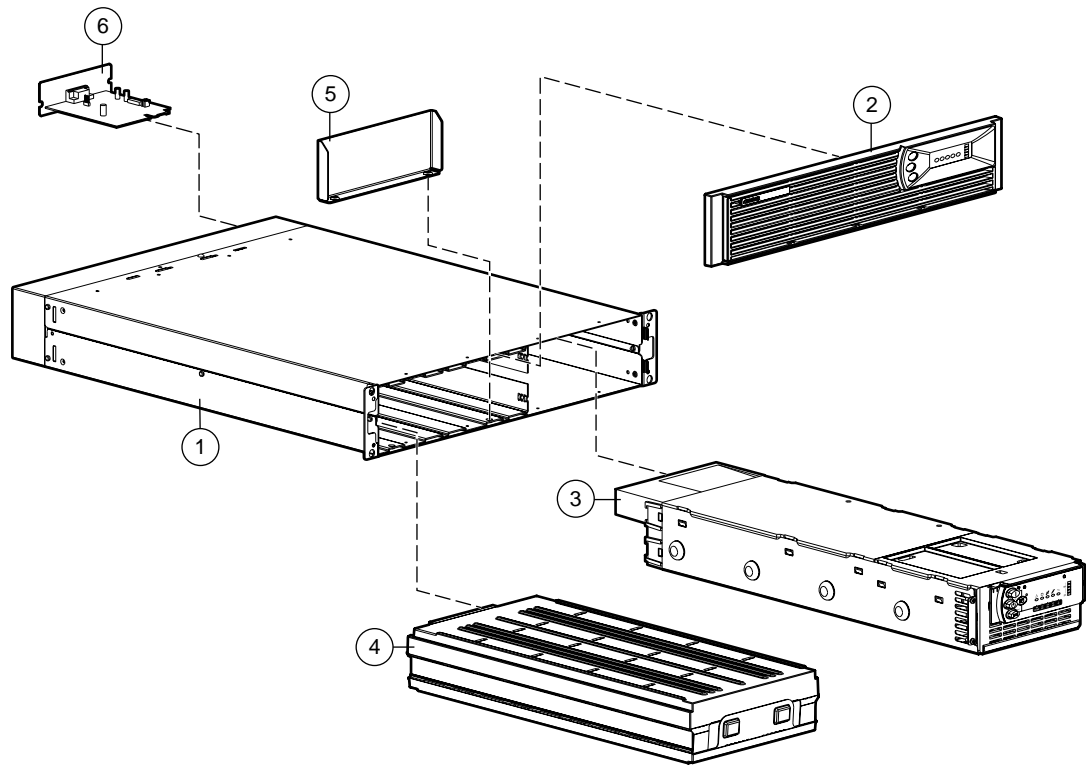


Figure 2-1. Exploded view, Compaq UPS R3000 XR

Table 2-1
UPS Spares Parts List

Ref	Description	Spares Part #
①	UPS Chassis	**
②	Front Bezel	204507-001
③	Electronics Module (low voltage)	204506-001
	Electronics Module (high voltage)	216097-001*
④	UPS Battery Pack	204503-001
⑤	Battery Bracket	**
⑥	X-Slot Serial Board	204514-001
⑦	UPS L530-NA	222383-001*
	UPS L530-JP	222383-291*
	UPS 620H-NA	222384-001*
	UPS DTC-INTL	222385-002*
	UPS 309-EURO	222386-021*
⑧	Cord Retention Clip	204505-001*
⑨	Front and Rear Mounting Brackets	204504-001*
⑩	Mounting Rail	322578-002*
⑪	Maintenance and Service Guide	223932-001*
Cables		
⑫	UPS to server interface cable	204508-001*
⑬	UPS to UPS interface cable	204509-001*
* Not shown		
** No spare available		

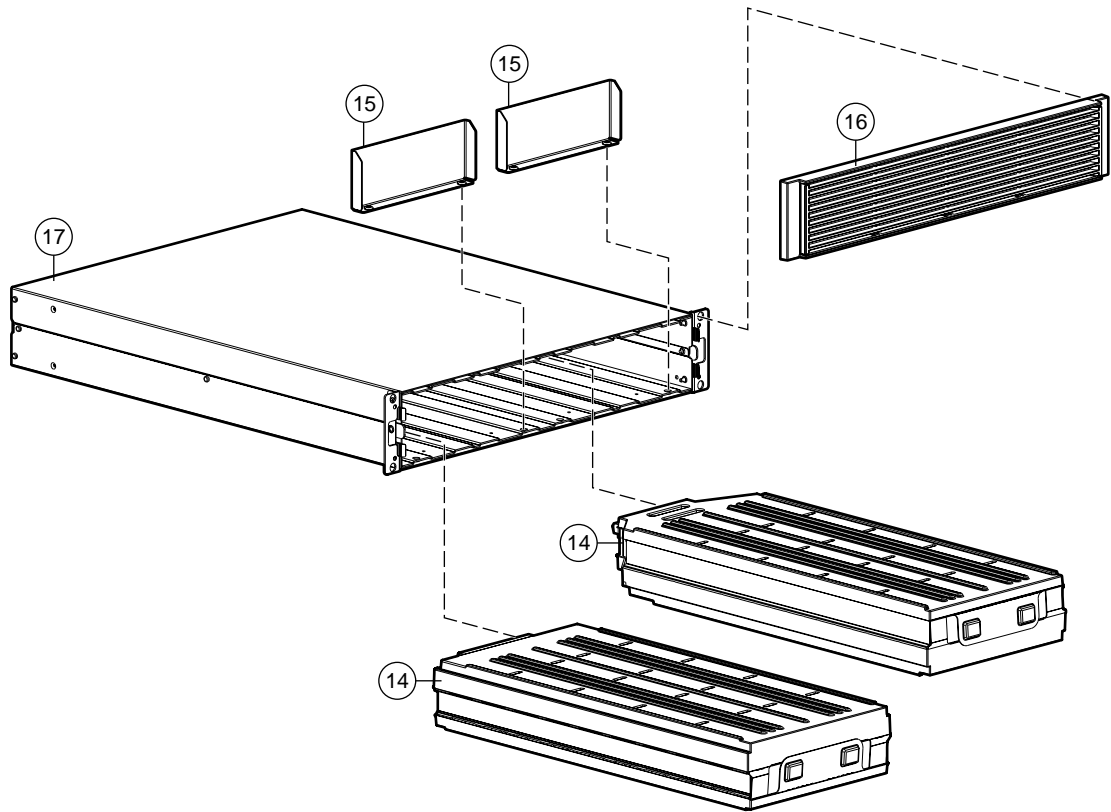


Figure 2-2. Exploded view, Extended Runtime Module

Table 2-2
Extended Runtime Module Spares Parts List

Ref	Description	Spares Part #
14	Battery Packs	204503-001
15	Battery Brackets	**
16	Front Bezel	204511-001
17	Chassis for Extended Runtime Module	**
18	Extended Runtime Module	204510-001*
19	Front and Rear Mounting Brackets	204504-001*
20	Mounting Rail	322578-002*
Cables		
21	ERM to UPS Cable	216092-001*
* Not shown		
** No spare available		

Chapter 3

Removal and Replacement Procedures

This chapter provides guidance for removing and replacing spare parts in the Compaq UPS R3000 XR.

Before You Begin



WARNING: The Compaq UPS R3000 XR is a high-energy product. There is a risk of personal injury from electrical shock and hazardous energy levels. Persons performing installation or service procedures must be Trained Service Technicians, knowledgeable about the procedures, precautions, and hazards associated with high-energy AC Power Products.

Before beginning any of the procedures in this chapter, read and understand the cautions and warnings in Chapter 1, “Before You Begin.”

Replaceable Parts

The UPS R3000 XR contains the following replaceable parts:

- Front bezel
- UPS battery pack
- Electronics module
- Option or communication board
- UPS unit
- ERM battery packs
- Extended Runtime Modules (ERMs)

Tools Required

To service a UPS R3000 XR, you need one or more of the following:

- #2 Phillips screwdriver
- ¼-inch driver
- Compaq Power Management Utility (from the Compaq *SmartStart*™ and Support Software CD)
- Voltmeter to verify the nominal voltages to ensure proper configuration

Identifying Components

Use the following illustrations to locate and identify the components of the UPS R3000 XR.

Front Panel

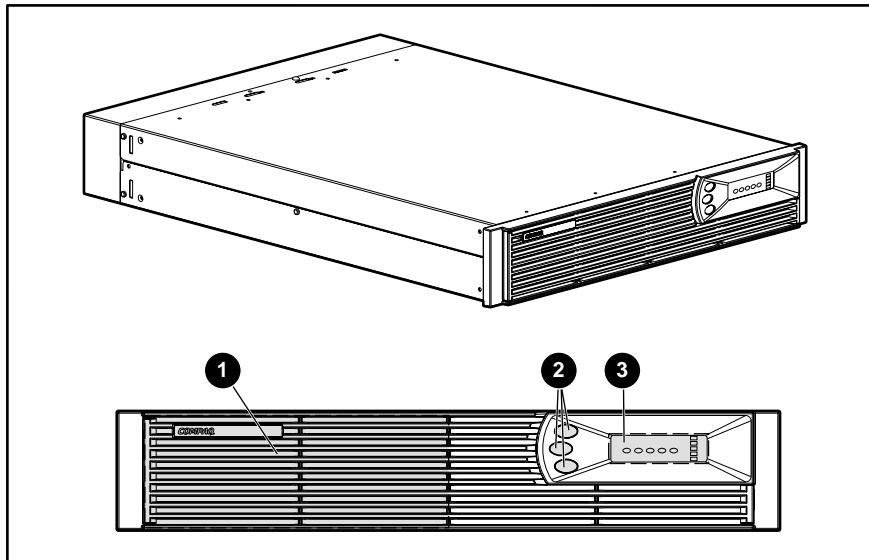


Figure 3-1. Front panel

Table 3-1
Front Panel Component Identification

Item	Description
❶	Battery compartment
❷	Control buttons
❸	LED display

Front Panel Controls and LED Display

The UPS front panel contains four control buttons and ten LEDs that create the interface for setup, configuration, load control, and status monitoring.

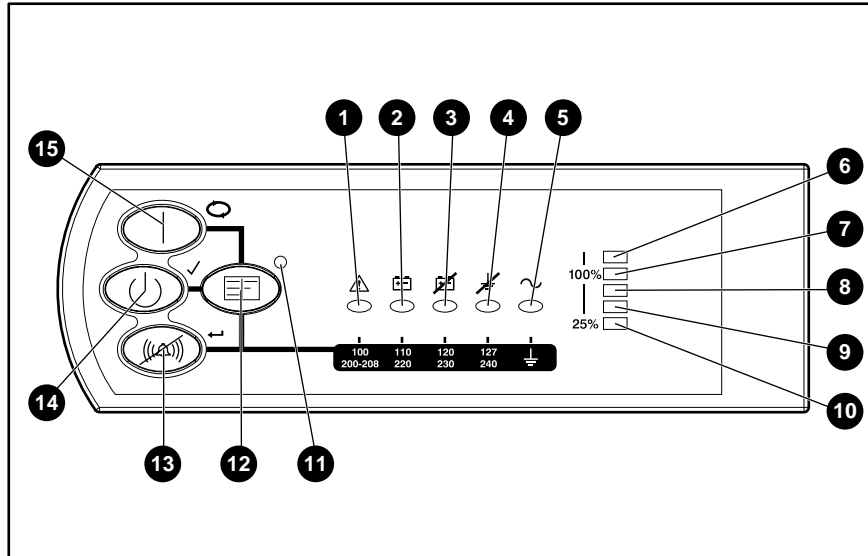


Figure 3-2. Front panel controls and LED display with front bezel removed

Table 3-2
Front Panel Controls and LED Display

Item	Name	Function
①	General Alarm	Indicates a general alarm when red
②	On Battery	Indicates that the battery is on when red
③	Bad Battery/Low Battery	Indicates that the battery is bad or low when red
④	Site Wiring Fault Indicator	Indicates a wiring fault when red
⑤	Utility LED	Indicates that: <ul style="list-style-type: none"> The unit is in Auto-Bypass mode when red The utility voltage is present and output is on when green The utility input voltage is outside nominal range when flashing red The utility voltage is present and the UPS is in Standby mode when flashing green
⑥	Overload LED	Indicates that the UPS exceeds maximum power available when red
⑦	76% to 100% load	Indicates that the UPS is approximately 76% to 100% of the maximum power available when green

continued

Table 3-2
Front Panel Controls and LED Display *continued*

Item	Name	Function
⑧	51% to 75% load	Indicates that the UPS is approximately 51% to 75% of the maximum power available when green
⑨	26% to 50% load	Indicates that the UPS is approximately 26% to 50% of the maximum power available when green
⑩	0% to 25% load	Indicates that the UPS is approximately 0% to 25% of the maximum power available when green
⑪	Configure mode on LED	Indicates that the UPS is in Configure mode
⑫	Configure button	Places the UPS in Configure mode
⑬	TEST/ALARM RESET button	Initiates a self-test and silences audio alarms
⑭	STANDBY button	Places the UPS in Standby mode
⑮	ON button	Places the UPS in Operate mode

Rear Panel Components

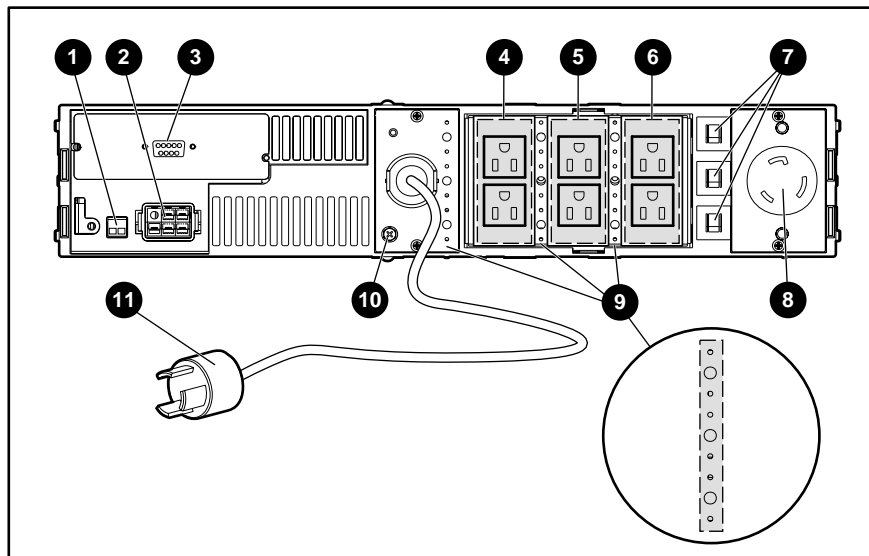


Figure 3-3. Low voltage unit rear panel components

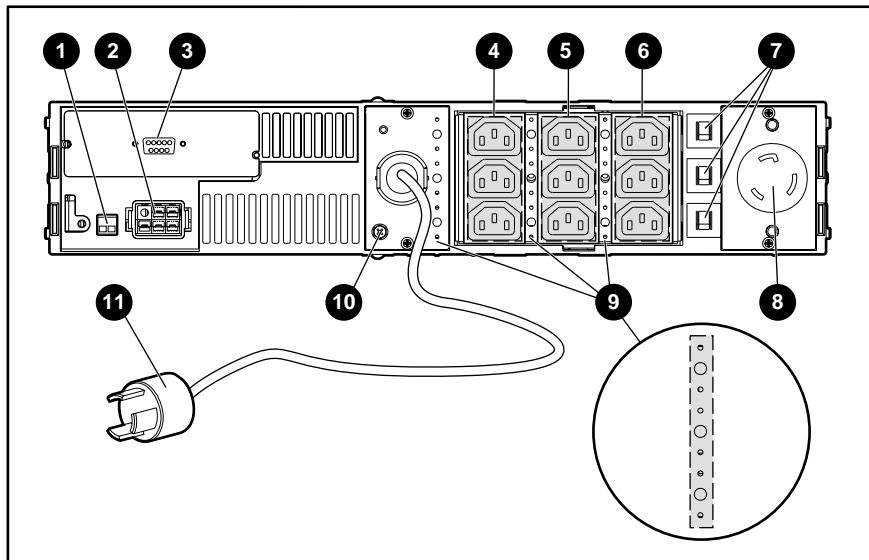


Figure 3-4. High voltage unit rear panel components

Table 3-3
Rear Panel Components

Item	Description
1	REPO port
2	ERM connector
3	Communications port/Options slot
4	Load segment 1
5	Load segment 2
6	Load segment 3
7	Load segment circuit protectors
8	Compaq PDU output receptacle (Load segment 1)
9	Cord retention clip attachment locations
10	Ground bonding screw
11	Power cord with plug

Modes of Operation

The UPS has four modes of operation: Standby, Operate, Configure, and Auto-Bypass.

Standby Mode

Place the UPS in Standby mode by pressing the STANDBY button on the front panel. During Standby mode:

- No power is available at the UPS output receptacles.
- The UPS charges the batteries as necessary.

Operate Mode

Place the UPS in Operate mode by pressing the ON button on the front panel. During Operate mode:

- Power is available at the UPS output receptacles.
- The UPS charges the batteries as necessary.

Configure Mode

Place the UPS in Configure mode by removing the front bezel and pressing and holding the Configure button on the front panel until the Configure mode on LED turns solid green. In the Configure mode, the front panel LED display changes function. The LED display and control buttons let you monitor and change the UPS configuration parameters.

In the Configure mode:

- Press the ON button to advance to the next configuration mode.
- Press the TEST/ALARM RESET button to accept the select configuration.
- Press the STANDBY button to turn the LED configuration on or off.

While the UPS is in Configure mode:

- Power is available at the UPS output receptacles.
- The UPS charges the batteries as necessary.
- The configuration of the UPS can be updated.

Auto-Bypass Mode

The UPS automatically switches to Auto-Bypass mode if the following conditions occur:

- The power (wattage) to the unit reaches a percentage greater than 110 percent for 10 cycles or 103 percent for 30 seconds.
- The UPS power module fails or is removed.

Powering Down the UPS

To completely remove power from the UPS:

1. Power down all equipment being supported by the UPS (attached loads).
2. Place the UPS in Standby mode by pressing the STANDBY button on the front panel.
3. Disconnect the UPS from utility power.
4. Wait at least 60 seconds for the UPS internal circuitry to discharge.

Emergency Shutdown

Compaq UPS R3000 XR models include a Remote Emergency Power Off (REPO) port as required by the National Electric Code (NFPA 70). The REPO port allows you to shut the UPS down from a remote location. You can connect the REPO ports of multiple UPSs to a single switch or circuit to shut down your entire system in an emergency.

IMPORTANT:

The REPO feature shuts down protected devices immediately and does not follow the orderly shutdown procedure initiated by Compaq Power Management Software.

The REPO feature shuts down devices that are operating under either utility or battery power.

If the UPS was operating on battery power when the remote switch was closed, no power will be available to the devices until utility power is restored and the devices are manually powered up.

The UPS R3000 XR REPO circuit is an IEC950 Secondary Extra Low Voltage (SELV) circuit. The computer room Emergency Power shutdown circuit conductors that connect to the REPO terminals must:

- Meet the requirements of an NEC Class 2 circuit or IEC950 Secondary Extra Low Voltage (SELV) circuit
- Be separated from any hazardous voltage circuits or conductors by reinforced insulation
- Short the UPS R3000 XR REPO terminals.
- Disconnect the UPS R3000 XR AC input source.

To shut down the system:

1. Place the UPS on Standby.
2. Disconnect the mains by opening the switch or circuit breaker at the utility panel.



WARNING: To reduce the risk of electrical shock and/or equipment damage, use a Lockout/Tagout procedure to isolate the UPS R3000 XR from AC power before wiring the product or replacing a non-hot-plug component.

Replacing the UPS Battery Pack

When the Bad Battery/Low Battery LED ❶ turns red, the battery pack will need to be replaced within 30 to 60 days.

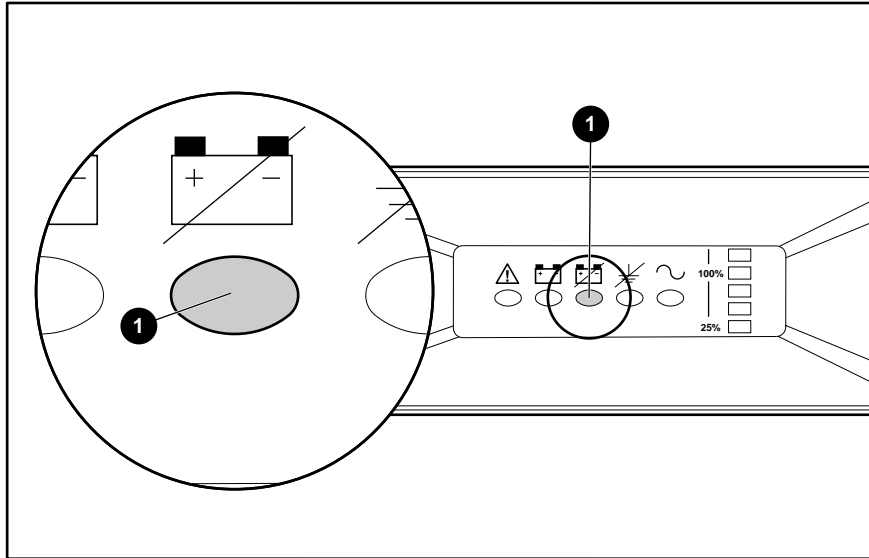


Figure 3-5. Bad Battery/Low Battery LED

Verify that battery replacement is required by initiating a UPS self-test (press the TEST/ALARM RESET button). If the red LED is still flashing after the test, replace the batteries.

NOTE: Depending on usage and environmental conditions, the batteries should last three to six years.

The battery packs are accessed from the front of the unit.

NOTE: Batteries can be replaced (hot-swapped) without powering off the UPS if the UPS is not supplying battery power to devices (utility is present, indicating that the UPS is supplying utility power). To replace batteries with the UPS power off, follow the procedure in “Powering Down the UPS,” in this chapter.

To replace the battery pack:

1. Obtain access to the battery pack by pulling on both ends of the front bezel ❶ to remove it.
2. Locate the two screws ❷ on the metal battery bracket ❸.

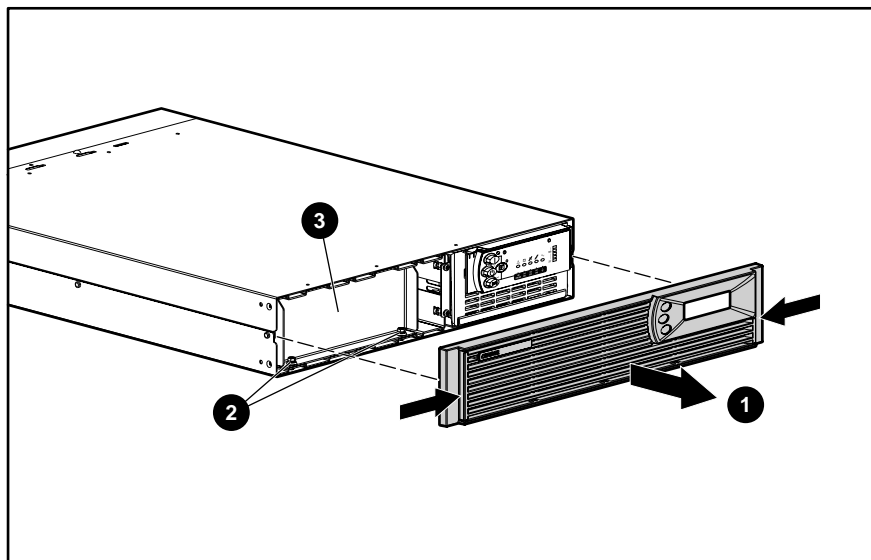


Figure 3-6. Removing the front bezel

3. Remove the two screws ❶ and lift off the metal battery bracket ❷.

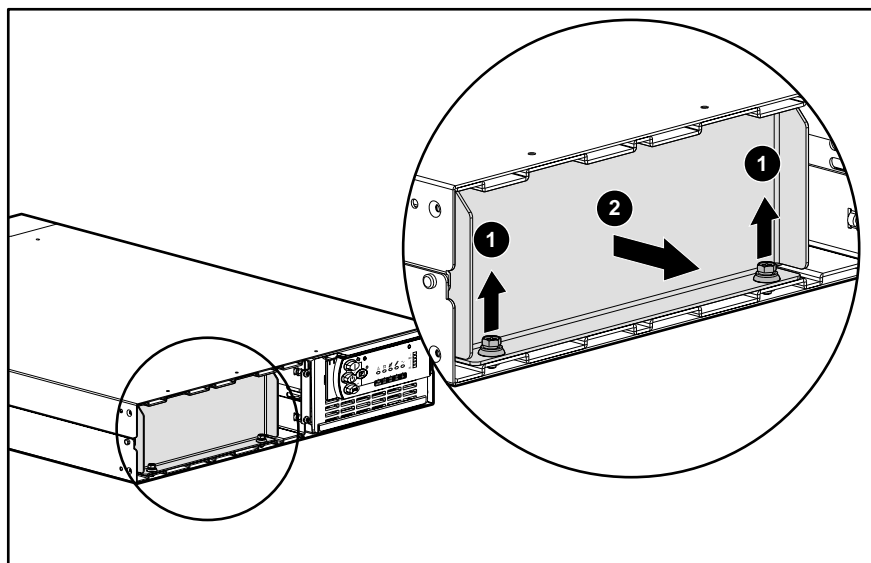


Figure 3-7. Removing the battery bracket

4. Pull out the battery pack. Set aside the used battery pack for proper disposal. See “Disposing of Used Batteries,” in this chapter.

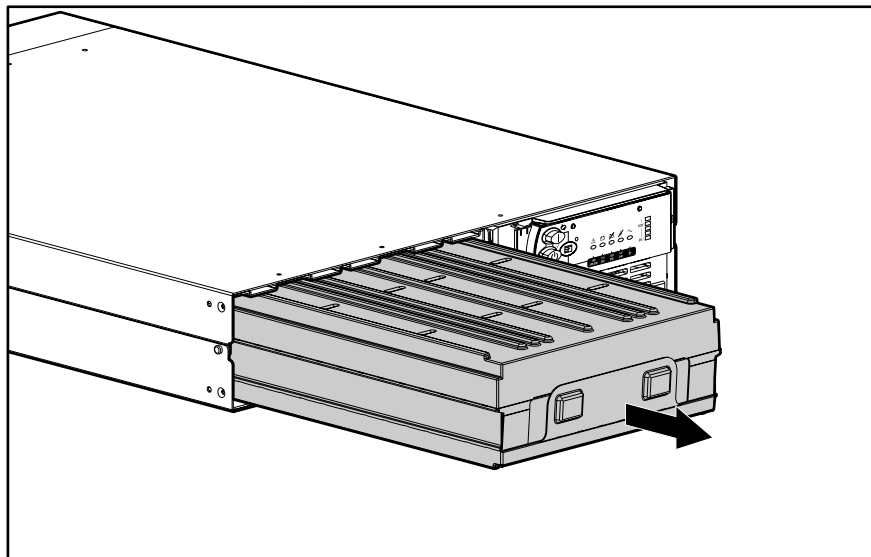


Figure 3-8. Removing the battery pack



WARNING: The UPS R3000 XR battery pack weighs 42 lb (19 kg). Prepare the area and observe all materials handling procedures for removing the battery pack.

5. Slide the new battery pack into the chassis.
6. Replace the metal battery bracket and secure the two screws.
7. Snap on the front bezel.
8. Initiate a UPS self-test by pressing the TEST/ALARM RESET button.

Disposing of Used Batteries

The UPS uses sealed lead/acid batteries that must be disposed of in accordance with local environmental regulations and laws.

If a local approved recycle/disposal site is not available, your replacement battery kit includes the instructions and packaging required to return used batteries to an appropriate location for disposal.



Pb

Do not dispose of used batteries with general office or household waste. Return the used battery for proper disposal to:

- Compaq, your authorized Compaq Partners, or their agents
- A recycling center that meets all local environmental standards

Replacing the Electronics Module

NOTE: The electronics module can be replaced (hot-swapped) without powering off the UPS. To replace the electronics module with the UPS power off, follow the procedure in “Powering Down the UPS,” in this chapter.



CAUTION: To avoid dropping the load while hot-swapping the electronics module, hold down the TEST/ALARM RESET button while sliding the new electronics module into the chassis. The TEST/ALARM RESET button is located on the UPS front panel.

To replace the electronics module:

1. Disconnect the communications cable.

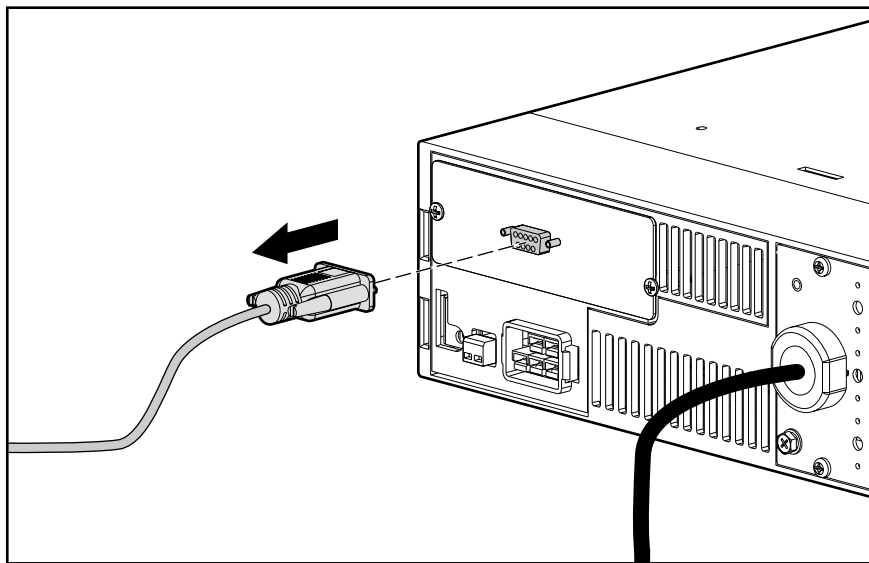


Figure 3-9. Disconnecting the communications cable

2. Obtain access to the electronics module by pulling on both ends of the front bezel ❶ to remove it.
3. Locate the two screws ❷ on the electronics module ❸.

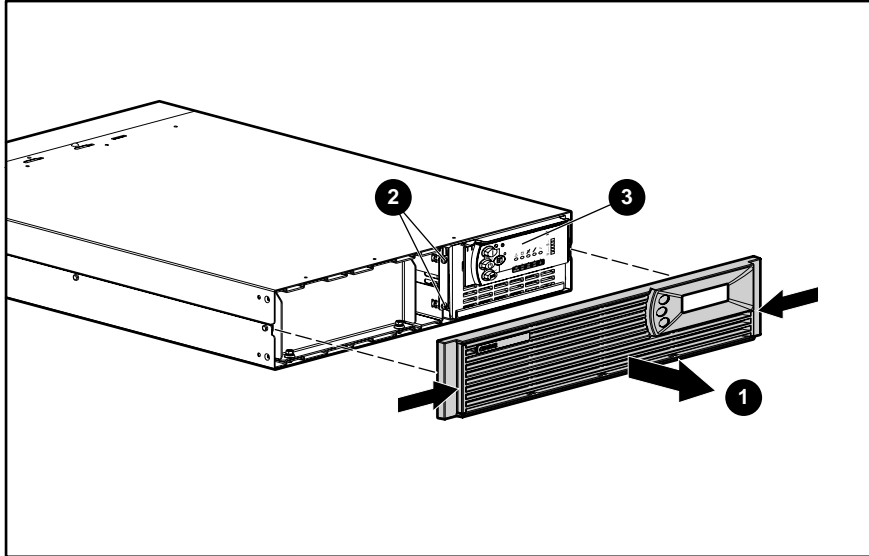


Figure 3-10. Removing the front bezel

4. Remove the two screws ❶ and pull out the electronics module ❷.

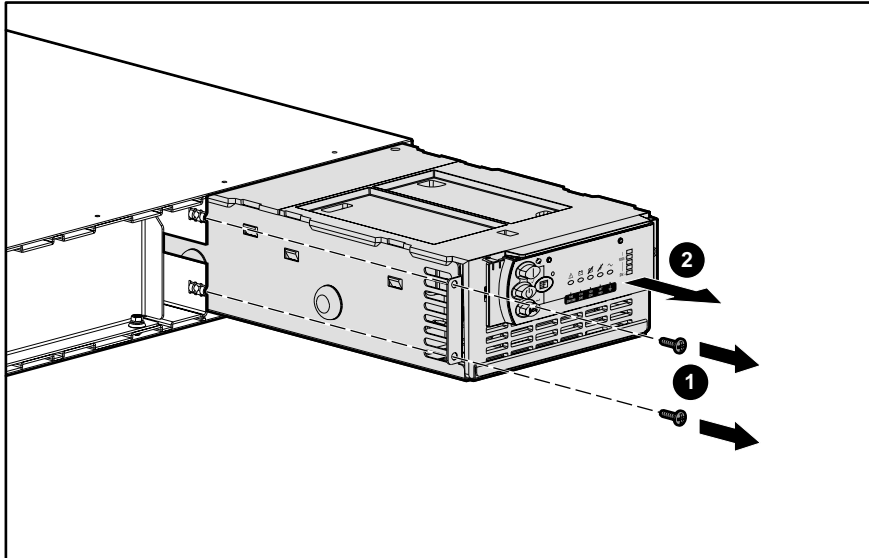


Figure 3-11. Removing the electronics module



CAUTION: To avoid dropping the load while hot-swapping the electronics module, hold down the TEST/ALARM RESET button while sliding the new electronics module into the chassis.

3. Hold down the TEST/ALARM RESET button ❶ on the front panel of the new electronics module and slide the electronics module into the chassis ❷. Do not release the TEST/ALARM RESET button until the electronics module is firmly seated in the connector, the Configure mode on LED flashes green, and a UPS self-test begins (about four seconds).

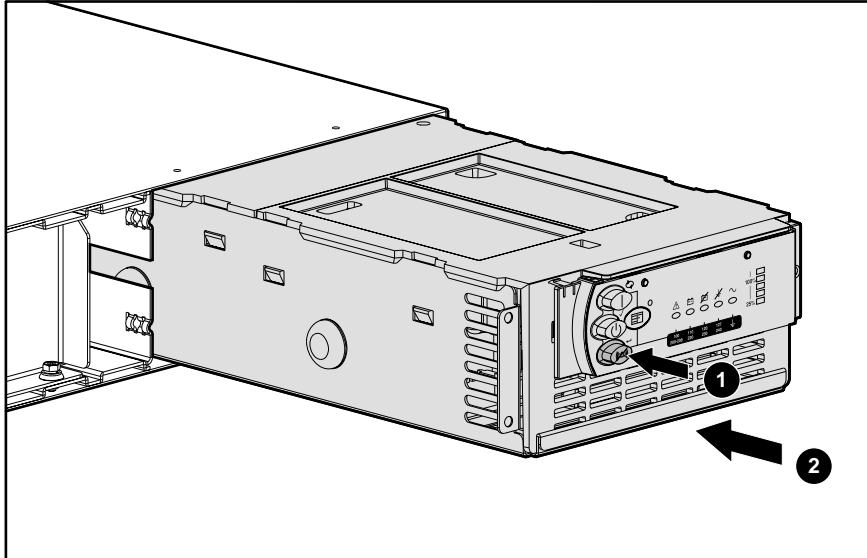


Figure 3-12. Inserting the electronics module

5. Secure the two screws.
6. Snap on the front bezel.
7. Attach the communications cable.

Replacing an Option or Communication Board

NOTE: The option or communication board can be replaced (hot-swapped) without powering off the UPS. To replace the option or communication board with the UPS power off, follow the procedure in “Powering Down the UPS,” in this chapter.

To remove an option or communication board:

1. Disconnect the external cable from the board.

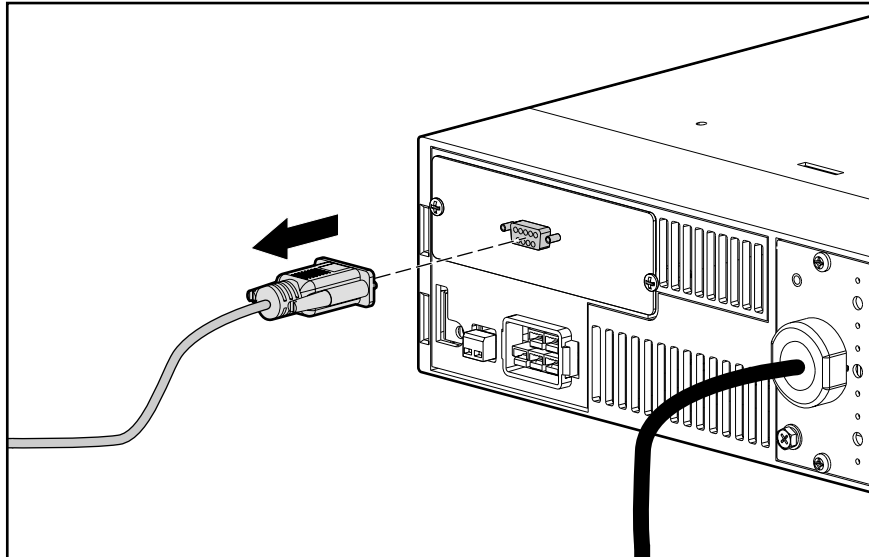


Figure 3-13. Disconnecting option board cables

2. If the UPS is powered down, proceed to step 3.

If hot-swapping the board, remove the electronics module. See steps 2 through 4 in “Replacing the Electronics Module.” The UPS switches to Auto-Bypass mode.

3. Remove the screws securing the board to the UPS.
4. Pull the board out of the unit.

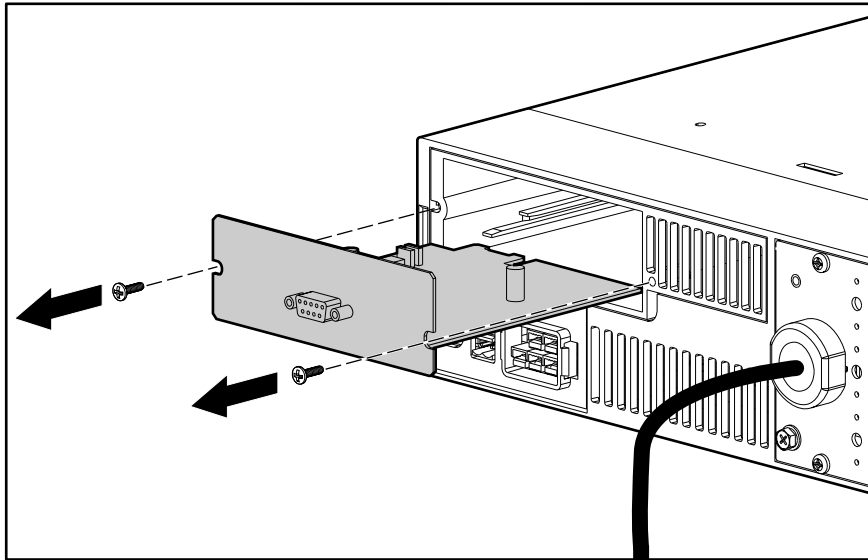


Figure 3-14. Removing an option board

5. Slide the new board into the UPS.
6. Tighten the screws that secure the board to the UPS.
7. If the UPS is powered down, proceed to step 8.

If hot-swapping the board, replace the electronics module. See steps 5 through 7 in “Replacing the Electronics Module.”



CAUTION: To avoid dropping the load, hold down the TEST/ALARM RESET button while sliding the new electronics module into the chassis.

8. Reconnect the external cable.

NOTE: Replacing the communication board resets the timer and schedules.

NOTE: The power management software may need to be rebooted after hot-swapping the board.

Replacing the UPS Unit

To replace the UPS:

1. Power down the UPS. Follow the procedure in “Powering Down the UPS,” in this chapter.
2. Turn **all** battery circuit breakers on the ERMs (one circuit breaker each) to the Off position.

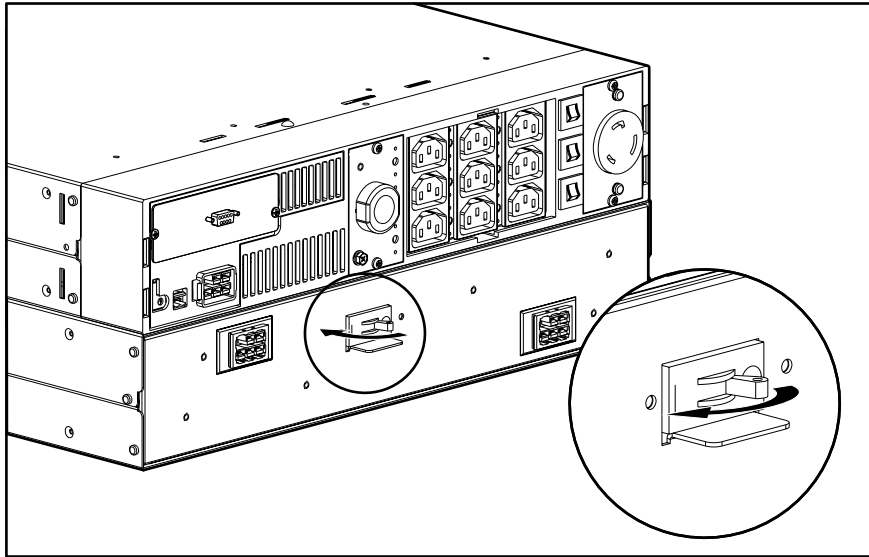


Figure 3-15. Switching the circuit breaker to the Off position

3. Unplug the UPS power cable.
4. Unplug connected devices and remove the retention clips that secure device cables to the UPS.
5. Unplug an attached ERM from the back of the UPS.

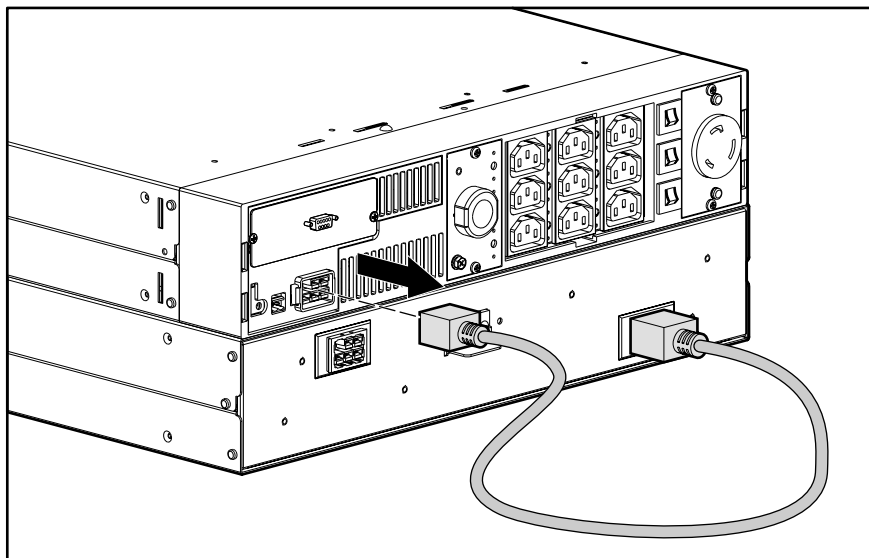


Figure 3-16. Unplugging the Extended Runtime Module

6. Remove the UPS front bezel.
7. Remove the screws that secure the UPS to the front of the rack.
8. Remove the UPS from the rack.
9. To replace the UPS, place the new unit in the rack and reverse steps 1 through 7.

Extended Runtime Modules

Extended Runtime Modules (ERMs) are supported by the Compaq UPS R3000 XR. The UPS rear panel provides a power receptacle where the module is attached. The UPS R3000 XR ERM contains two battery packs in a 2U chassis and extends the available UPS runtime up to 30 minutes.

NOTE: These figures were derived using the Compaq-recommended 80 percent load.

Replacing ERM Battery Packs

NOTE: The battery packs can be replaced (hot-swapped) without powering down the UPS.

To remove battery packs from an ERM:

1. Switch the circuit breaker on the rear of the ERM to the Off position.

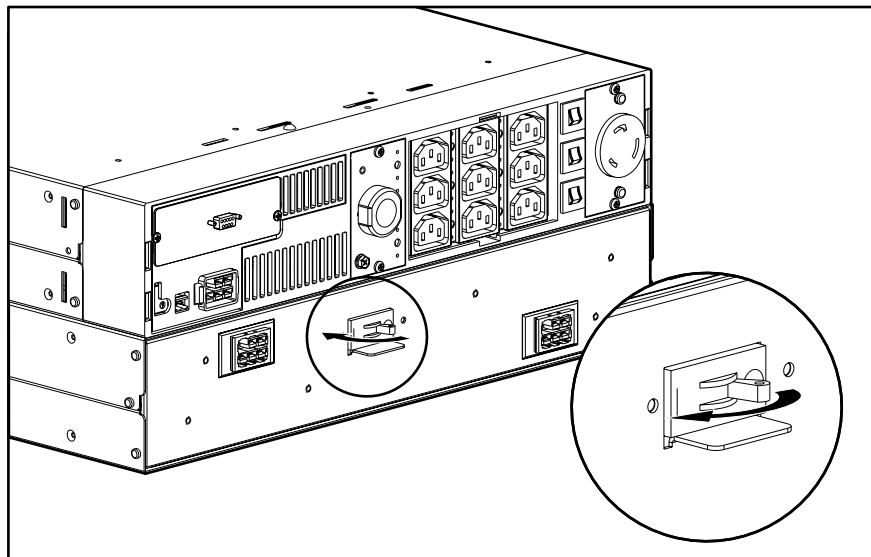


Figure 3-17. Switching the circuit breaker to the Off position

2. Obtain access to the battery packs by pulling on both ends of the ERM front bezel to remove it.

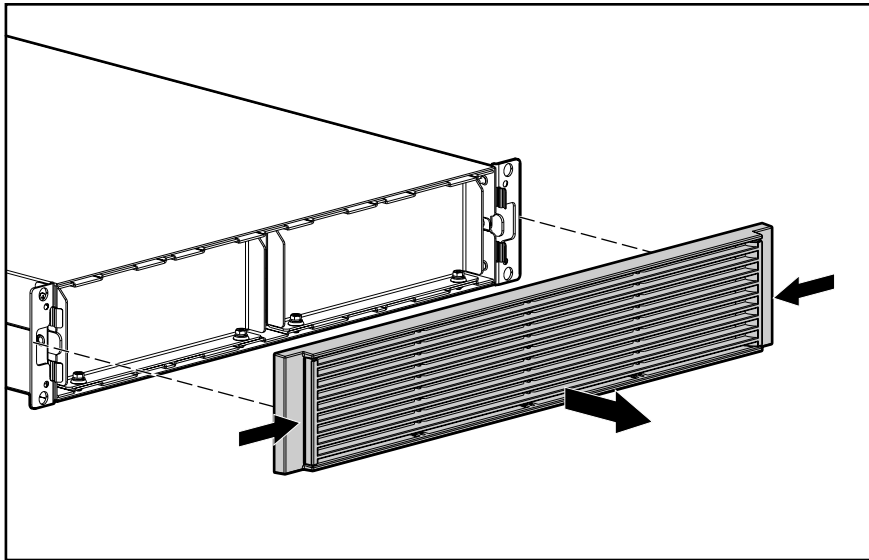


Figure 3-18. Removing the ERM front bezel

3. Remove two screws ❶ from each metal battery bracket and lift off the battery brackets ❷.

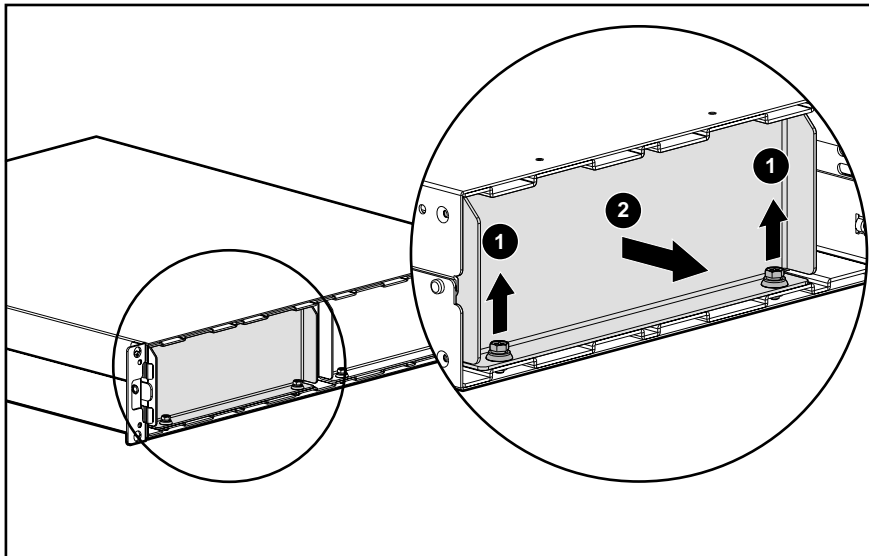


Figure 3-19. Removing the battery bracket

4. Pull out the battery packs. Set aside the used battery packs for proper disposal. See “Disposing of Used Batteries,” in this chapter.

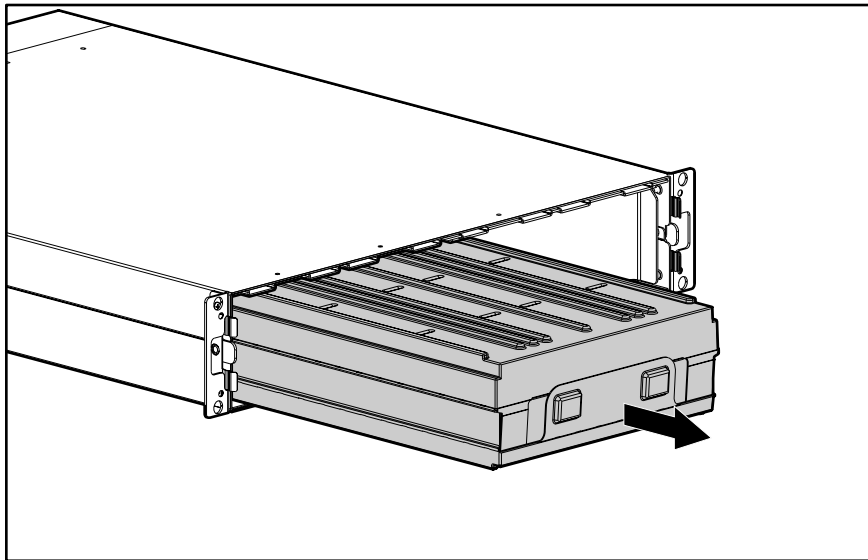


Figure 3-20. Removing the battery packs

5. To replace the battery packs, reverse steps 1 through 4.

NOTE: The right battery pack is inserted upside down.

NOTE: To increase the useful life of the replacement battery, replace all batteries in the UPS and connected ERMs at the same time.

Replacing an ERM

To replace an ERM:

1. Turn **all** battery circuit breakers on all attached ERMs (one circuit breaker each) to the Off position.
2. Unplug the ERM from the back of the UPS.

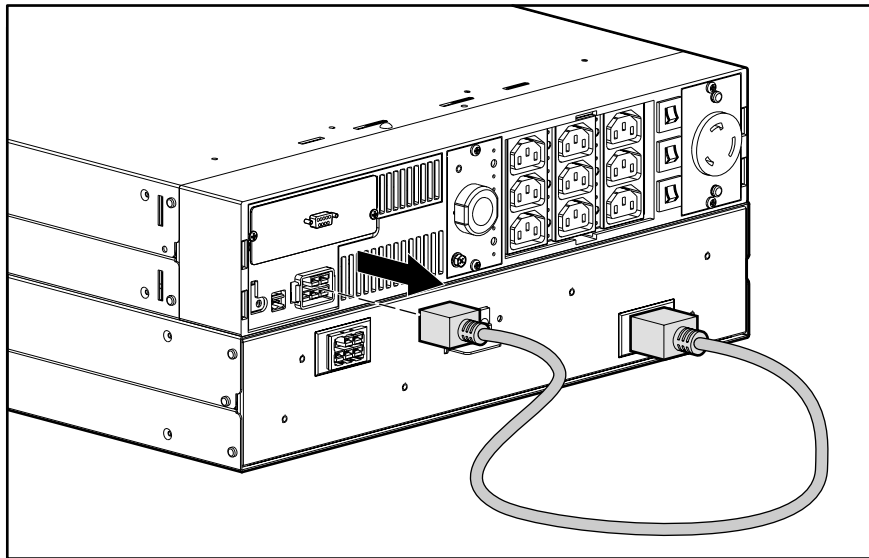


Figure 3-21. Unplugging the Extended Runtime Module

4. Remove the front bezel from the ERM you want to replace.
5. Remove the screws that secure the ERM to the front of the rack.
6. Remove the ERM from the rack.
7. To replace the ERM, place the new ERM in the rack and reverse steps 1 through 4.

Troubleshooting

This chapter provides information on the following topics:

- Troubleshooting problems that occur during UPS start
- Troubleshooting problems that occur after UPS start

Troubleshooting During Start

If problems occur when starting the Compaq UPS R3000 XR models, select the appropriate symptom for possible causes and suggested actions.

Table 4-1
Troubleshooting Guide (UPS Start)

Symptom	Possible Cause	Suggested Action
UPS will not start	There is no utility power and the batteries are not charged.	Check the power at the utility power receptacle or contact a qualified electrician.
	The UPS power cord is disconnected.	Connect the power cord.
Site Wiring Fault LED is red	The utility power receptacle is ungrounded or there is no ground wire in the UPS power cord.	Contact a qualified electrician to correct the condition.
	Line and neutral wires are reversed in the utility power receptacle or in the UPS power cord.	For units factory-configured for 200V or 208V, the Site Wiring Fault function has been disabled. If reconfiguring a 230V unit to operate at 208V, the Site Wiring Fault function must be manually disabled. (high voltage models only)

continued

Table 4-1
Troubleshooting Guide (UPS Start) *continued*

Symptom	Possible Cause	Suggested Action
Bad Battery/Low Battery LED is flashing red	Battery voltage is low because the UPS has been out-of-service for a long period.	Allow the UPS to charge the batteries for 24 hours. Initiate a self-test. If the LED does not turn off, replace the batteries.
	The battery test failed.	Allow the UPS to charge the batteries for 24 hours. Initiate a self-test. If the LED does not turn off, replace the batteries.
	The battery is disconnected.	Install the battery pack. If the battery pack is installed, remove it and then insert it again.

Troubleshooting After Start

For problems that occur after the UPS has gone through the startup self-test sequence, these suggested actions address possible causes.

Table 4-2
Troubleshooting Guide (After Start)

Symptom	Possible Cause	Suggested Action
Audio Alarm sounds	An alarm condition exists.	Identify the red LED associated with the alarm condition. Check this troubleshooting guide to determine the cause of the alarm.
Utility LED and On Battery LED are flashing red	The utility voltage is too high.	The utility voltage is higher than the UPS operating range. The UPS switches to battery power. If this happens repeatedly, update the configuration.
		Contact a qualified electrician to ensure that utility power is suitable for the UPS.
Utility LED and On Battery LED are flashing red	The utility voltage is too low.	The utility voltage is lower than the UPS operating range. The UPS switches to battery power. If this happens repeatedly, update the configuration.
		Contact a qualified electrician to ensure that utility power is suitable for the UPS.

continued

Table 4-2
Troubleshooting Guide (After Start) *continued*

Symptom	Possible Cause	Suggested Action
Utility LED and On Battery LED are flashing red	The utility frequency is out of tolerance.	Contact a qualified electrician to ensure that utility power is suitable for the UPS.
Utility LED is flashing red	The utility input voltage is outside the $\pm 12\%$ nominal range.	If this happens repeatedly, check the input voltage and reconfigure the unit. Contact a qualified electrician to ensure that utility power is suitable for the UPS.
Utility LED is flashing green	The utility power is within the acceptable range, but the output is off.	Press the ON button.
UPS frequently switches between utility and battery power	There are utility power variations.	The utility voltage is frequently outside the UPS operating range. Update the configuration. Contact a qualified electrician to ensure that utility power is suitable for the UPS.
Overload LED is red	Protected devices are exceeding the UPS power rating. (UPS may switch from utility to Auto-Bypass.)	Remove one or more devices to reduce the power requirements. Make sure that the devices are not defective.
On Battery LED is flashing red	There is low battery voltage.	If the UPS is supplying battery power, save current work and shut down the system. Allow the batteries to charge. If the UPS is supplying utility power, no intervention is required. Allow the batteries to charge.
Insufficient warning of low batteries	Battery service is required. The Shutdown Delay configuration is inappropriate.	Allow the batteries to charge for 24 hours, then initiate a self-test. If the LED is red, replace the batteries. Use the Compaq power management software to specify a suitable delay.

continued

Table 4-2
Troubleshooting Guide (After Start) *continued*

Symptom	Possible Cause	Suggested Action
Utility LED is flashing red and the unit is in Auto-Bypass mode	A potential for overload exists.	Reduce the load.
	An over-temperature condition may exist.	Ensure that there is no blockage of airflow to the front bezel and rear panel.
	The electronics module may have failed.	Replace the electronics module.
Bad Battery/Low Battery LED is flashing red	A potential battery failure has been detected.	Allow the batteries to charge for 24 hours, then initiate a self-test. If the LED is red, replace the batteries.
	New batteries are improperly connected.	Reinsert the battery pack.
All LEDs are flashing red and the audio alarm cannot be silenced	An internal UPS fault condition exists.	Replace the electronics module.

Chapter 5

Specifications

This chapter provides specifications that apply to all Compaq UPS R3000 XR models:

- Physical specifications
- Input specifications
- Output specifications
- Overcurrent protection
- Battery specifications
- Battery runtime
- Environmental specifications

Physical Specifications

Table 5-1
Physical Characteristics

Feature		U.S.	Metric
Dimensions	Width	19.0 in	483 mm
	Height	3.5 in	89 mm
	Depth	24.5 in	622 mm
Weight		82 lb	37 kg

Input Specifications

Table 5-2
Input Specifications

UPS Model	Utility Voltage Frequency (Hz)	Default Settings Nominal Voltage (VAC)	Available Settings Utility Voltage (VAC)	Power Cord Supplied
R3000 XR-NA	50/60	120	100, 110, 120, 127	Non-detachable power cord with NEMA L5-30 plug
R3000j XR-JPN	50/60	100	100, 110, 120, 127	Non-detachable power cord with NEMA L5-30 plug
R3000h XR-NA	50/60	208	200, 220, 230, 240	Non-detachable power cord with NEMA L6-20 plug
R3000h XR-JPN	50/60	208	200, 220, 230, 240	Non-detachable power cord with NEMA L6-20 plug
R3000e XR-INT	50/60	208	200, 220, 230, 240	Detachable power cord with country-specific plug
R3000i XR-EURO	50/60	230	200, 208, 220, 240	Non-detachable power cord with 16A IEC-309 plug
R3000i XR-SCHUKO	50/60	230	200, 208, 220, 240	Non-detachable power cord with 16A CEE 7/7 SCHUKO plug
R3000i XR-SA	50/60	230	200, 208, 220, 240	Non-detachable power cord with 16A BS-546 plug

Output Specifications

Table 5-3
Output Specifications

UPS Model	Effective VA	Nominal Power Rating (W)	Load Segment #	Output Receptacles
R3000 XR-NA	2880	2700	1	2 x 5-15R 1 x L5-30R
			2	2 x 5-15R
			3	2 x 5-15R
R3000j XR-JPN	2400	2250	1	2 x 5-15R 1 x L5-30R
			2	2 x 5-15R
			3	2 x 5-15R
R3000h XR-NA	3000	2700	1	3 x IEC-320, C13 1 x L6-20R
			2	3 x IEC-320, C13
			3	3 x IEC-320, C13
R3000h XR-JPN	3000	2700	1	3 x IEC-320, C13 1 x L6-20R
			2	3 x IEC-320, C13
			3	3 x IEC-320, C13
R3000e XR-INT	3000	2700	1	3 x IEC-320, C13 1 x IEC-320, C19
			2	3 x IEC-320, C19
			3	3 x IEC-320, C13
R3000i XR-EURO; R3000i XR-SCHUKO; R3000i XR-SA	3000	2700	1	3 x IEC-320, C13 1 x IEC-320, C19
			2	3 x IEC-320, C13
			3	3 x IEC-320, C13

**Table 5-4
Output Specifications**

Characteristics	Configuration Setting (VAC)	Available Nominal Output Voltage (VAC)
Voltage	100	100
	110	110
	120	120
	127	127
	200	200
	208	208
	230	230
	240	240
Output	Source of Power	Regulation
	Utility power (normal range)	-10% to +6% of nominal output voltage rating (within the guidelines of the Computer Business Equipment Manufacturers Association)
	Battery power	±5% of nominal output voltage rating
Other features	Feature	Specification
	On-line efficiency	94%
	Voltage wave shape	Sine wave; 5% THD with typical PFC load
	Surge suppression	High energy 6500A peak
	Noise filtering	MOVs and line filter for normal and common mode use

Overcurrent Protection

Table 5-5
Overcurrent Protection Per Model

UPS Model	Input Protection
R3000 XR-NA	Circuit protector for each load segment
R3000j XR-JPN	Circuit protector for each load segment
R3000h XR-NA	Circuit protector for each load segment
R3000h XR-JPN	Circuit protector for each load segment
R3000e XR-INT	Circuit protector for each load segment
R3000i XR-EURO	Circuit protector for each load segment
R3000i XR-SCHUKO	Circuit protector for each load segment
R3000i XR-SA	Circuit protector for each load segment

Battery Specifications

Table 5-6
Battery Specifications

Feature	Specification
Type	Sealed lead-acid; maintenance-free
Voltage	120V battery string
Charging	24 hours to full charge 4 hours to 90% capacity at default nominal utility voltage and no load

Battery Runtime

Table 5-7
Estimated Battery Runtime

Load (Percent)	Estimated Battery Runtime (Minutes)	UPS with ERM Runtime (Minutes)
20	40	120
50	12	45
80	6.5	30
100	5	20

Environmental Specifications

Table 5-8
Environmental Specifications

Feature	Specification
Operating temperature	10°C to 40°C (50°F to 104°F) UL-tested at 25°C (77°F)
Relative humidity	0% to 95%; non-condensing
Operating altitude	Up to 2,000 m (6,562 ft) above sea level*
Audible noise	Less than 45 dBA
Transit temperature	-25°C to +55°C (-13°F to 131°F)
Transit altitude	15,000 m (49,212 ft) above sea level

*Due to thermal limitations, the UPS will be derated above 2,000 m (6,561 ft).

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